

---

# SUPPLEMENTS to CIRCULATION

*An Official Journal of the American Heart Association*

---

**VOLUMES 53 AND 54**

**January-December, 1976**

**Author and Subject Indexes to Supplements I and II are included in those issues.**



**AMERICAN HEART ASSOCIATION, INC.**

---

---

## SUPPLEMENTS

to

## CIRCULATION

AN OFFICIAL JOURNAL OF THE AMERICAN HEART ASSOCIATION  
7320 Greenville Ave., Dallas, Texas 75231

---

EDITOR OF SUPPLEMENTS

Neal S. Bricker, M.D.

---

*Supplements to CIRCULATION will be published occasionally for binding annually in a separate volume entitled Supplements to CIRCULATION. Each supplement's page numbers will begin with page one. Supplements to CIRCULATION will be indexed separately at the end of the year.*

---

PUBLICATIONS COMMITTEE, AMERICAN HEART ASSOCIATION

Stanford Wessler, *Chairman*

*New York, N. Y.*

---

Neal Bricker <i>Miami, Fla.</i>	Thomas N. James <i>Birmingham, Ala.</i>	Lucille E. Notter <i>New York, N.Y.</i>	Eugene A. Stead, Jr. <i>Durham, N.C.</i>
Arthur Guyton <i>Jackson, Miss.</i>	Thomas Killip <i>New York, N.Y.</i>	Milton C. Paige, Jr. <i>Boston, Mass.</i>	Arthur Waltz <i>San Francisco, Calif.</i>
Donald Harrison <i>Stanford, Calif.</i>	Herbert J. Levine <i>Boston, Mass.</i>	Richard L. Popp <i>Stanford, Calif.</i>	Paul Yu <i>Rochester, N.Y.</i>
Brian Hoffman <i>New York, N.Y.</i>	Clark H. Millikan <i>Rochester, Minn.</i>	Abraham Rudolph <i>San Francisco, Calif.</i>	

---

Published at the Publication Office, 7320 Greenville Ave., Dallas, Texas 75231. Second class postage paid at Dallas, Texas, and additional mailing offices.

---

Copyright © 1976. The American Heart Association, Inc., 7320 Greenville Ave., Dallas, Texas 75231

# SUPPLEMENTS to CIRCULATION

VOLUMES 53 AND 54

January-December, 1976

## PROTECTION OF THE ISCHEMIC MYOCARDIUM

No. 1 (March)

### INTRODUCTORY REMARKS

Eugene Braunwald ..... I-1

### I. THE CELLULAR BASIS OF ISCHEMIA AND INFARCTION

Chairman: Howard E. Morgan I-3

#### Contribution of Tissue Acidosis to Ischemic Injury in the Perfused Rat Heart

John R. Williamson, Stephen W. Schaffer, Christopher Ford, Brian Safer ..... I-3

#### Brief Communication: Possible Effects of Hydrogen Ions in Ischemic Myocardium

Richard W. Tsien ..... I-14

#### Studies on the Subcellular Pathophysiology of Ischemia

Benjamin F. Trump, Wolfgang J. Mergner, Myong Won Kahng, Andrew J. Saladino ..... I-17

#### Discussion: Relationship of Acute Ischemia to Functional Defects and Irreversibility

Robert B. Jennings ..... I-26

#### Brief Communication: Effect of Cardiac Ischemia on Protein Degradation

D. Eugene Rannels, R. Race Kao, Howard E. Morgan ..... I-30

#### General Discussion

..... I-31

#### Lysosomes in Myocardial Infarction: Studies by Means of Cytology and Subcellular Fractionation, with Observations on the Effect of Methylprednisolone

Sylvia Hoffstein, Gerald Weissmann, Arthur C. Fox ..... I-34

#### Discussion: How do Cardiac Cells Die?

Harry A. Fozard ..... I-40

#### General Discussion

..... I-41

#### Session Chairman's Closing Remarks: The Cellular Basis of Ischemia and Infarction

Howard E. Morgan ..... I-43

### II. CONSEQUENCES OF MYOCARDIAL ISCHEMIA

Chairman: H. J. C. Swan I-45

#### Effects of Hyperosmotic Mannitol in Reducing Ischemic Cell Swelling and Minimizing Myocardial Necrosis

W. John Powell, Jr., Donald R. DiBona, Jorge Flores, Norberto Fregia, Alexander Leaf ..... I-45

(Continued)

S-III

<b>Discussion</b>		
James T. Willerson .....	I-49	
<b>Discussion</b>		
Benjamin F. Trump .....	I-52	
<b>General Discussion</b>		I-54
<b>Influence of Collateral Flow on the Ischemic Tolerance of the Heart Following Acute and Subacute Coronary Occlusion</b>		
Wolfgang Schaper, Stanislaw Pasyk .....	I-57	
<b>Discussion</b>		
Colin M. Bloor .....	I-63	
<b>General Discussion</b>		I-65
<b>Platelet Aggregation Secondary to Coronary Obstruction</b>		
Sean Moore .....	I-66	
<b>Discussion</b>		
John C. Hoak .....	I-69	
<b>General Discussion</b>		I-70
<b>Session Chairman's Closing Remarks: Consequences of Myocardial Ischemia</b>		
H. J. C. Swan .....	I-71	
<b>III. THE CHARACTERIZATION OF MYOCARDIAL ISCHEMIC INJURY AND INFARCTION</b>		I-73
Chairman: Burton E. Sobel		
<b>Electrocardiographic ST-Segment Analysis in the Characterization of Myocardial Ischemia and Infarction</b>		
John Ross, Jr. .....	I-73	
<b>Brief Communication: First Electrocardiographic Sign of Myocardial Ischemia: An Electrophysiological Conjecture</b>		
Edward A. Johnson .....	I-82	
<b>Brief Communication: Clinical Uses of Precordial ST-Segment Mapping and the Pathophysiology of ST-Segment Voltage Changes</b>		
John T. Flaherty .....	I-85	
<b>Analysis of Regional Myocardial Function, Dimensions, and Wall Thickness in the Characterization of Myocardial Ischemia and Infarction</b>		
John Ross, Jr., Dean Franklin .....	I-88	
<b>Brief Communication: ST-Segment Mapping in Ischemia and Infarction</b>		
William B. Hood, Jr. .....	I-93	
<b>General Discussion</b>		I-95
<b>Biochemical Markers of Ischemic Injury</b>		
William E. Shell, Burton E. Sobel .....	I-98	
<b>Brief Communication: Assessment of Myocardial Injury with Creatine Phosphokinase (CPK)</b>		
John K. Kjekshus .....	I-106	
<b>Serial CPK Determinations for Evaluation of Size and Development of Acute Myocardial Infarction</b>		
Walter H. Bleifeld, P. Hanrath, D. Mathey .....	I-108	
<b>General Discussion</b>		I-111
<b>Radionuclide Methods in the Evaluation of Myocardial Ischemia and Infarction</b>		
B. Leonard Holman .....	I-112	
<b>Discussion: Limitations of Present Radionuclide Methods in the Evaluation of Myocardial Ischemia and Infarction</b>		
Michel M. Ter-Pogossian .....	I-119	
<b>Discussion</b>		
Bertram Pitt, H. William Strauss .....	I-121	
<b>Brief Communication: Radionuclide Techniques in the Assessment of Myocardial Ischemia and Infarction</b>		
George A. Beller, Thomas W. Smith .....	I-123	
<b>Brief Communication: Radionuclide Imaging of Myocardial Ischemia and Infarction</b>		
Barry L. Zaret .....	I-126	
<b>Discussion</b>		
James T. Willerson .....	I-128	

(Continued)

## CONTENTS OF SUPPLEMENTS

S-V

<b>Session Chairman's Closing Remarks: The Characterization of Myocardial Ischemic Injury and Infarction</b>	
Burton E. Sobel .....	I-129
<b>IV. NATURAL HISTORY OF MYOCARDIAL ISCHEMIC DAMAGE</b>	
Chairman: Michael F. Oliver .....	I-132
<b>Natural History of Myocardial Infarction and Its Prodromal Syndromes</b>	
Bertram Pitt .....	I-132
<b>Discussion</b>	
John O. Parker .....	I-135
<b>Discussion</b>	
Robert Rosati .....	I-138
<b>General Discussion</b>	
<b>The Relationship of Myocardial Infarct Size and Prognosis</b>	
James B. Caulfield, Robert Leinbach, Herman Gold .....	I-141
<b>Discussion</b>	
Benjamin F. Trump .....	I-145
<b>Brief Communication: Infarct Size, Prognosis, and Causal Contiguity</b>	
Burton E. Sobel .....	I-146
<b>General Discussion</b>	
<b>Relations Between Enzymatically Estimated Myocardial Infarct Size and Early Ventricular Dysrhythmia</b>	
Jerome R. Cox, Jr., Robert Roberts, H. Dieter Ambos, G. Charles Oliver, Burton E. Sobel .....	I-150
<b>Discussion: Significance of Ventricular Arrhythmias During Myocardial Ischemia</b>	
Michael F. Oliver .....	I-155
<b>Discussions Have We Solved the Arrhythmia Problem?</b>	
Harry A. Fozard .....	I-158
<b>General Discussion</b>	
<b>Session Chairman's Closing Remarks: Natural History of Myocardial Ischemic Damage</b>	
Michael F. Oliver .....	I-161
<b>V. ASSESSMENT OF INTERVENTIONS DESIGNED TO REDUCE MYOCARDIAL ISCHEMIC DAMAGE</b>	
Chairman: Eugene Braunwald .....	I-162
<b>Effects of Metabolic and Pharmacologic Interventions on Myocardial Infarct Size Following Coronary Occlusion</b>	
Peter R. Maroko, Eugene Braunwald .....	I-162
<b>Brief Communication: The Influence of Myocardial Metabolism on Ischemic Damage</b>	
Michael F. Oliver .....	I-168
<b>Brief Communication: Corticosteroids and Membrane Stabilization</b>	
Gerald Weissmann .....	I-171
<b>Brief Communication: Observations on Myocardial Oxygen Consumption in the Hypoxic and Ischemic Canine Heart</b>	
W. John Powell, Jr., Eric R. Powers, Gus J. Vlahakes .....	I-173
<b>Mechanical and Surgical Interventions for the Reduction of Myocardial Ischemia</b>	
Eldred D. Mundth .....	I-176
<b>Discussion</b>	
James T. Willerson .....	I-183
<b>Discussion</b>	
C. Richard Conti .....	I-185
<b>General Discussion</b>	
<b>Protection of Ischemic Myocardium by Nitroglycerin: Experimental and Clinical Results</b>	
Stephen E. Epstein, Jeffrey S. Borer, Kenneth M. Kent, David R. Redwood, Robert E. Goldstein, Barrie Levitt .....	I-191
<b>General Discussion</b>	
<b>Brief Communication: Reduction of Precordial ST-Segment Elevation in Patients with Anterior Myocardial Infarction by Oxygen Breathing</b>	
John E. Madias, William B. Hood, Jr. .....	I-198
<b>General Discussion</b>	
	I-200

(Continued)

<b>Brief Communication: Modification of Myocardial Injury in Man by Corticosteroid Administration</b>	
John Morrison, Lawrence Reduto, Roy Pizzarello, Kenneth Geller, Thomas Maley, Stephen Gulotta .....	I-200
<b>General Discussion</b> .....	I-203
<b>Brief Communication: Deleterious Effects of Methylprednisolone in Patients with Myocardial Infarction</b>	
Robert Roberts, Vincent DeMello, Burton E. Sobel .....	I-204
<b>General Discussion</b> .....	I-206
<b>Brief Communication: Glucose-Insulin-Potassium, Free Fatty Acids and Acute Myocardial Infarction in Man</b>	
Richard O. Russell, Jr., William J. Rogers, John A. Mantle, Huey G. McDaniel, Charles E. Rackley .....	I-207
<b>General Discussion</b> .....	I-209
<b>Brief Communication: Effect of Reducing Circulating Free Fatty Acids on Ventricular Arrhythmias during Myocardial Infarction and on ST-Segment Depression during Exercise-Induced Ischemia</b>	
Michael F. Oliver, M. J. Rowe, M. R. Luxton, N. E. Miller, J. M. Neilson .....	I-210
<b>General Discussion</b> .....	I-213
<b>ASSESSMENT OF FUTURE DIRECTIONS BY SESSION CHAIRMEN</b>	
Howard E. Morgan .....	I-213
H. J. C. Swan .....	I-214
Burton E. Sobel .....	I-215
Eugene Braunwald .....	I-216
<b>AUTHOR INDEX</b> .....	I-219
<b>SUBJECT INDEX</b> .....	I-221

---

### ABSTRACTS FOR THE 49TH SCIENTIFIC SESSIONS

Scientific Sessions for Nurses,  
 30th Annual Meeting,  
 Council on Arteriosclerosis — American Society for the Study of Arteriosclerosis  
 No. 2 (October)

---

### CARDIOVASCULAR SURGERY 1975

No. 3 (December)

<b>Comparison of Internal Mammary Artery and Saphenous Vein Bypass Grafts for Myocardial Revascularization: Exercise Test and Angiographic Correlations</b>	
Wayne Siegel and Floyd D. Loop .....	III-1
<b>Hemodynamic Effects of Nitroprusside Infusion During Coronary Artery Operation in Man</b>	
Demetrios G. Lappas, Edward Lowenstein, John Waller, Nabil R. Fahmy, and Willard M. Daggett .....	III-4
<b>Improved Myocardial Performance After Aortic Cross Clamping By Combining Pharmacologic Arrest with Total Hypothermia</b>	
Roy L. Nelson, S. Myron Goldstein, Douglas H. McConnell, James V. Maloney, Jr., and Gerald D. Buckberg .....	III-11
<b>Pulmonary Artery Banding for Truncus Arteriosus in the First Year of Life</b>	
Arun K. Singh, Marc R. De Leval, John R. Pincott, and Jaroslav Stark .....	III-17
<b>Determination of Improved Myocardial Perfusion After Aortocoronary Bypass Surgery by Exercise Rubidium-81 Scintigraphy</b>	
Arthur J. Lurie, Antone F. Salel, Daniel S. Berman, Gerald L. DeNardo, Edward J. Hurley, and Dean T. Mason .....	III-20

(Continued)

## CONTENTS OF SUPPLEMENTS

S-VII

<b>Perioperative Myocardial Infarction Diagnosed by Technetium 99m Stannous Pyrophosphate Myocardial Scintigrams</b>	
Melvin R. Platt, Lawrence J. Mills, Robert W. Parkey, James T. Willerson, Frederick J. Bonte, William Shapiro, and Winfred L. Sugg .....	III-24
<b>Current Status of Porcine Heterograft Prostheses: A 5-Year Appraisal</b>	
Hamner Hannah III and Robert L. Reis .....	III-27
<b>Long-term Follow-up of Patients with Coronary Artery Bypass Grafts</b>	
Quentin R. Stiles, George G. Lindesmith, Bernard L. Tucker, Richard K. Hughes, and Bert W. Meyer .....	III-32
<b>Pulmonary Atresia: Surgical Considerations and Results in 103 Patients Undergoing Definitive Repair</b>	
Christian L. Olin, Donald G. Ritter, Dwight C. McGoon, Robert B. Wallace, and Gordon K. Danielson .....	III-35
<b>Refractory Angina Pectoris: Follow-up After Intraaortic Balloon Pumping and Surgery</b>	
Herman K. Gold, Robert C. Leinbach, Mortimer J. Buckley, Eldred D. Mundth, Willard M. Daggett, and W. Gerald Austen .....	III-41
<b>Mitral Valve Replacement: A 10-Year Follow-up of Non-Cloth-Covered vs. Cloth-Covered Caged-Ball Prostheses</b>	
Albert Starr, Gary Grunkemeier, Louis Lambert, J. Edward Okies, and David Thomas .....	III-47
<b>Does Cardiac Transplantation Prolong Life and Improve Its Quality? An Updated Report</b>	
Sharon A. Hunt, Alan K. Rider, Edward B. Stinson, Randall B. Griep, John S. Schroeder, Donald C. Harrison, and Norman E. Shumway .....	III-56
<b>Actuarial Comparison of Hancock Porcine and Prosthetic Disc Valves for Isolated Mitral Valve Replacement</b>	
Lawrence H. Cohn, John H. Sanders, and John J. Collins Jr. .....	III-60
<b>Use of a Valved Conduit from Right Atrium to Pulmonary Artery for "Correction" of Single Ventricle</b>	
Magdi H. Yacoub and Rosemary Radley-Smith .....	III-63
<b>Patency of Internal Mammary-Coronary Grafts</b>	
Hendrick B. Barner, J. Gerard Mudd, Alexander L. Mark, Naseer Ahmad, and Judith F. Dickens .....	III-70
<b>Continuous Detection of Microemboli During Cardiopulmonary Bypass in Animals and Man</b>	
Richard E. Clark, Dennis R. Dietz, and James G. Miller .....	III-74
<b>Relationship Between Right Ventricular Muscle Bundles and Pulmonary Valve: Significance in Pulmonary Atresia With Intact Ventricular Septum</b>	
Kit V. Arom and Jesse E. Edwards .....	III-79
<b>Homograft and Prosthetic Aortic Valve Replacement: A Comparative Study</b>	
Michael Pine, Gary Hahn, Bruce Paton, George Pappas, D. Hywel Davies, Peter Steele, Ray Pryor, and S. Gilbert Blount, Jr. ....	III-84
<b>Balloon Counterpulsation Following Surgery for Ischemic Heart Disease</b>	
Patrick J. Scanlon, John O'Connell, Sarah A. Johnson, John M. Moran, Rolf Gunnar, and Roque Pifarre .....	III-90
<b>Myocardial Revascularization and Mitral Repair or Replacement for Mitral Insufficiency Due to Coronary Artery Disease</b>	
Jerome Harold Kay, Pablo Zubiate, A. Michael Mendez, and Edward F. Dunne	III-94
<b>Operative Management of Tricuspid Regurgitation</b>	
George E. Reed, Arthur D. Boyd, Frank C. Spencer, Richard M. Engelmann, O. Wayne Isom, and Joseph N. Cunningham .....	III-96
<b>Hemodynamic Evaluation of Fontan Operation in Tricuspid Atresia</b>	
Maria Serrato, Robert A. Miller, Constantine Tatooles, and Rostam Ardekani .....	III-99
<b>Postcardiotomy Low Cardiac Output Clinical Experience with a Left Heart Assist Device</b>	
Robert L. Litwak, Salvador B. Lukban, Roy A. Jurado, Robert M. Koffsky, Arcadio F. Ortiz, Jr., Adam P. Fischer, and James J. Sherman .....	III-102
<b>The VA Cooperative Randomized Study of Surgery for Coronary Arterial Occlusive Disease: II. Subgroup with Significant Left Main Lesions</b>	
Timothy Takaro, Herbert N. Hultgren, Martin J. Lipton, and Katherine M. Detre, and Participants in the Study Group .....	III-107
<b>Surgical Treatment of Aneurysms of the Ascending Aorta</b>	
Joe N. Kidd, George J. Reul, Jr., Denton A. Cooley, Frank M. Sandiford, E. Ross Kyger, III, and Don C. Wukasch .....	III-118



## SUPPLEMENTS TO CIRCULATION

VOLUMES 53 and 54

JANUARY-DECEMBER, 1976

*Author Indexes to Protection of the Ischemic Myocardium, Supplement I, March 1976 and ABSTRACTS.  
AHA 49th Scientific Sessions, Supplement II, October 1976, are included in those issues.*

### AUTHOR INDEX

#### CARDIOVASCULAR SURGERY — NO. 3

##### A

Ahmad N, III-70  
Ardekani R, III-99  
Arom KV, III-79  
Austen WG, III-41

##### B

Barner HB, III-70  
Berman DS, III-20  
Blount SG Jr, III-84  
Bonte FJ, III-24  
Boyd AD, III-96  
Buckberg GD, III-11  
Buckley MJ, III-41

##### C

Clark RE, III-74  
Cohn LH, III-60  
Collins JJ Jr, III-60  
Cooley DA, III-118  
Cunningham JN, III-96

##### D

Daggett WM, III-4, III-41  
Danielson GK, III-35  
Davies DH, III-84  
De Leval MR, III-17  
DeNardo GL, III-20  
Detre KM, III-107  
Dickens JF, III-70  
Dietz DR, III-74  
Dunne EF, III-94

##### E

Edwards JE, III-79  
Engelman RM, III-96

##### F

Fahmy NR, III-4  
Fischer AP, III-102

##### G

Gold HK, III-41  
Goldstein SM, III-11  
Griep RB, III-56  
Grunkemeier G, III-47  
Gunnar R, III-90

##### H

Hahn G, III-84  
Hannah H 3rd, III-27  
Harrison DC, III-56  
Hughes RK, III-32

Hultgren HN, III-107  
Hunt SA, III-56  
Hurley EJ, III-20

I  
Isom OW, III-96

J  
Johnson SA, III-90  
Jurado RA, III-102

K  
Kay JH, III-94  
Kidd JN, III-118  
Koffsky RM, III-102  
Kyger ER 3rd, III-118

L  
Lambert L, III-47  
Lappas DG, III-4  
Leinbach RC, III-41  
Lindesmith GG, III-32  
Lipton MJ, III-107  
Litwak RL, III-102  
Loop FD, III-1  
Lowenstein E, III-4  
Lukban SB, III-102  
Lurie AJ, III-20

M  
Maloney JV Jr, III-11  
Mark AL, III-70  
Mason DT, III-20  
McConnell DH, III-11  
McGoon DC, III-35  
Mendez AM, III-94  
Meyer BW, III-32  
Miller JG, III-74  
Miller RA, III-99  
Mills LJ, III-24  
Moran JM, III-90  
Mudd JG, III-70  
Mundth ED, III-41

N  
Nelson RL, III-11

O  
O'Connell J, III-90  
Okies JE, III-47  
Olin CL, III-35  
Ortiz AF Jr, III-102

P  
Pappas G, III-84  
Parkey RW, III-24  
Paton B, III-84  
Pifarre R, III-90  
Pincott JR, III-17  
Pine M, III-84  
Platt MR, III-24  
Pryor R, III-84

R  
Radley-Smith R, III-63  
Reed GE, III-96  
Reis RL, III-27  
Reul GJ Jr, III-118  
Rider AK, III-56  
Ritter DG, III-35

S  
Salei AF, III-20  
Sanders JH, III-60  
Sandiford FM, III-118  
Scanlon PJ, III-90  
Schroeder JS, III-56  
Serrato M, III-99  
Shapiro W, III-24  
Sherman JJ, III-102  
Shumway NE, III-56  
Siegel W, III-1  
Singh AK, III-17  
Spencer FC, III-96  
Stark J, III-17  
Starr A, III-47  
Steele P, III-84  
Stiles QR, III-32  
Stinson EB, III-56  
Sugg WL, III-24

T  
Takaro T, III-107  
Tatooles C, III-99  
Thomas D, III-47  
Tucker BL, III-32

W  
Wallace RB, III-35  
Waller J, III-4  
Willerson JT, III-24  
Wukasch DC, III-118

Y  
Yacoub MH, III-63

Z  
Zubiate P, III-94



SUPPLEMENTS  
TO  
CIRCULATION

VOLUMES 53 AND 54

JANUARY-DECEMBER, 1976

*Subject Indexes to Protection of the Ischemic Myocardium, Supplement I, March 1976 and ABSTRACTS, AHA 49th Scientific Sessions, Supplement II, October 1976, are included in those issues.*

SUPPLEMENT SUBJECT INDEX

CARDIOVASCULAR SURGERY — NO. 3

A

**Aneurysms**

Surgical treatment of aneurysms of the ascending aorta, III-118

**Angiography**

Comparison of internal mammary artery and saphenous vein bypass grafts for myocardial revascularization: exercise test and angiographic correlations, III-1

**Angina pectoris**

Refractory angina pectoris: follow-up after intraaortic balloon pumping and surgery, III-41

**Aorta**

Homograft and prosthetic aortic valve replacement: a comparative study, III-84

Improved myocardial performance after aortic cross clamping by combining pharmacologic arrest with total hypothermia, III-11

Surgical treatment of aneurysms of the ascending aorta, III-118

**Arteries, coronary**

Hemodynamic effects of nitroprusside infusion during coronary artery operation in man, III-4

Long-term follow-up of patients with coronary artery bypass grafts, III-32

Myocardial revascularization and mitral repair or replacement for mitral insufficiency due to coronary artery disease, III-94

Patency of internal mammary-coronary grafts, III-70

The VA Cooperative Randomized Study of Surgery for Coronary Arterial Occlusive Disease: II. Subgroup with significant left main lesions, III-107

**Arteries, mammary**

Comparison of internal mammary artery and saphenous vein bypass grafts for myocardial revascularization: exercise test and angiographic correlations, III-1

Patency of internal mammary-coronary grafts, III-70

**Arteries, pulmonary**

Pulmonary artery banding for truncus arteriosus in the first year of life, III-17

Relationship between right ventricular muscle bundles and pulmonary valve: significance in pulmonary atresia with intact ventricular septum, III-79

Use of a valved conduit from right atrium to pulmonary artery for "correction" of single ventricle, III-63

**Atresia, pulmonary**

Pulmonary atresia: surgical considerations and results in 103 patients undergoing definitive repair, III-35

Relationship between right ventricular muscle bundles and pulmonary valve: significance in pulmonary atresia with intact ventricular septum, III-79

**Atresia, tricuspid**

Hemodynamic evaluation of Fontan operation in tricuspid atresia, III-99

B

**Balloon pumping**

Balloon counterpulsation following surgery for ischemic heart disease, III-90

Refractory angina pectoris: follow-up after intraaortic balloon pumping and surgery, III-41

**Bypass surgery**

Comparison of internal mammary artery and saphenous vein bypass grafts for myocardial revascularization: exercise test and angiographic correlations, III-1

Continuous detection of microemboli during cardiopulmonary bypass in animals and man, III-74

Determination of improved myocardial perfusion after aortocoronary bypass surgery by exercise rubidium-81 scintigraphy, III-20

Long-term follow-up of patients with coronary artery bypass grafts, III-32

Patency of internal mammary-coronary grafts, III-70

C

**Cardiac output**

Postcardiotomy low cardiac output clinical experience with a left heart assist device, III-102

**Cardiac transplantation**

Does cardiac transplantation prolong life and improve its quality? An updated report, III-56

**Cardiomyopathy**

Postcardiotomy low cardiac output clinical experience with a left heart assist device, III-102

**Congenital disorders**

Pulmonary artery banding for truncus arteriosus in the first year of life, III-17

Use of a valved conduit from right atrium to pulmonary artery for "correction" of single ventricle, III-63

**Coronary artery disease**

Myocardial revascularization and mitral repair or replacement for mitral insufficiency due to coronary artery disease, III-94

**Cross clamping, aortic**

Improved myocardial performance after aortic cross clamping by combining pharmacologic arrest with total hypothermia, III-11

D

**Drug therapy**

Improved myocardial performance after aortic cross clamping by combining pharmacologic arrest with total hypothermia, III-11

E

**Embolisms**

Continuous detection of microemboli during cardiopulmonary bypass in animals and man, III-74

**Exercise tests**

Comparison of internal mammary artery and saphenous vein bypass grafts for myocardial revascularization: exercise test and angiographic correlations, III-1

Determination of improved myocardial perfusion after aortocoronary bypass surgery by exercise rubidium-81 scintigraphy, III-20

## F

**Fontan operation**

Hemodynamic evaluation of Fontan operation in tricuspid atresia, III-99

## G

**Grafts**

- Actuarial comparison of Hancock porcine and prosthetic disc valves for isolated mitral valve replacement, III-60
- Comparison of internal mammary artery and saphenous vein bypass grafts for myocardial revascularization: exercise test and angiographic correlations, III-1
- Current status of porcine heterograft prostheses: a 5-year appraisal, III-27
- Homograft and prosthetic aortic valve replacement: a comparative study, III-84
- Long-term follow-up of patients with coronary artery bypass grafts, III-32
- Patency of internal mammary-coronary grafts, III-70

## H

**Heart transplantation**

Does cardiac transplantation prolong life and improve its quality? An updated report, III-56

**Heterografts**

- Actuarial comparison of Hancock porcine and prosthetic disc valves for isolated mitral valve replacement, III-60
- Current status of porcine heterograft prostheses: a 5-year appraisal, III-27

**Homografts**

- Homograft and prosthetic aortic valve replacement: a comparative study, III-84

**Hypertension**

Pulmonary atresia: surgical considerations and results in 103 patients undergoing definitive repair, III-35

**Hypothermia**

Improved myocardial performance after aortic cross clamping by combining pharmacologic arrest with total hypothermia, III-11

## I

**Ischemic heart disease**

Balloon counterpulsation following surgery for ischemic heart disease, III-90

## L

**Lesions**

The VA Cooperative Randomized Study of Surgery for Coronary Arterial Occlusive Disease: II. Subgroup with significant left main lesions, III-107

## M

**Microembolisms**

Continuous detection of microemboli during cardiopulmonary bypass in animals and man, III-74

**Mitral valve**

- Actuarial comparison of Hancock porcine and prosthetic disc valves for isolated mitral valve replacement, III-60
- Mitral valve replacement: a 10-year follow-up of non-cloth-covered vs. cloth-covered caged-ball prostheses, III-47
- Myocardial revascularization and mitral repair or replacement for mitral insufficiency due to coronary artery disease, III-94

**Monitoring procedures**

Continuous detection of microemboli during cardiopulmonary bypass in animals and man, III-74

**Myocardial infarction**

Perioperative myocardial infarction diagnosed by technetium 99m stannous pyrophosphate myocardial scintigrams, III-24

**Myocardial performance**

Determination of improved myocardial perfusion after aor-

tocoronary bypass surgery by exercise rubidium-81 scintigraphy, III-20

Improved myocardial performance after aortic cross clamping by combining pharmacologic arrest with total hypothermia, III-11

## N

**Nitroprusside**

Hemodynamic effects of nitroprusside infusion during coronary artery operation in man, III-4

## O

**Occlusive disease**

The VA Cooperative Randomized Study of Surgery for Coronary Arterial Occlusive Disease: II. Subgroup with significant left main lesions, III-107

## P

**Pacing and pacemakers**

Postcardiotomy low cardiac output clinical experience with a left heart assist device, III-102

**Pediatrics**

Pulmonary artery banding for truncus arteriosus in the first year of life, III-17

**Porcine heterografts**

- Actuarial comparison of Hancock porcine and prosthetic disc valves for isolated mitral valve replacement, III-60
- Current status of porcine heterograft prostheses: a 5-year appraisal, III-27

**Prosthetic devices**

Actuarial comparison of Hancock porcine and prosthetic disc valves for isolated mitral valve replacement, III-60

Current status of porcine heterograft prostheses: a 5-year appraisal, III-27

Homograft and prosthetic aortic valve replacement: a comparative study, III-84

Mitral valve replacement: a 10-year follow-up of non-cloth-covered vs. cloth-covered caged-ball prostheses, III-47

Use of a valved conduit from right atrium to pulmonary artery for "correction" of single ventricle, III-63

**Pulmonary atresia**

Pulmonary atresia: surgical considerations and results in 103 patients undergoing definitive repair, III-35

Relationship between right ventricular muscle bundles and pulmonary valve: significance in pulmonary atresia with intact ventricular septum, III-79

**Pulmonary valve**

Relationship between right ventricular muscle bundles and pulmonary valve: significance in pulmonary atresia with intact ventricular septum, III-79

## R

**Regurgitation**

Operative management of tricuspid regurgitation, III-96

**Right ventricle**

Pulmonary atresia: surgical considerations and results in 103 patients undergoing definitive repair, III-35

Relationship between right ventricular muscle bundles and pulmonary valve: significance in pulmonary atresia with intact ventricular septum, III-79

## S

**Scintigraphy**

Determination of improved myocardial perfusion after aortocoronary bypass surgery by exercise rubidium-81 scintigraphy, III-20

Perioperative myocardial infarction diagnosed by technetium 99m stannous pyrophosphate myocardial scintigrams, III-24

**Single ventricle**

Use of a valved conduit from right atrium to pulmonary artery for "correction" of single ventricle, III-63

**Stenosis**

Use of a valved conduit from right atrium to pulmonary artery for "correction" of single ventricle, III-63

**Survival studies**

Does cardiac transplantation prolong life and improve its quality? An updated report, III-56

Long-term follow-up of patients with coronary artery bypass grafts, III-32

Mitral valve replacement: a 10-year follow-up of non-cloth-covered vs. cloth-covered caged-ball prostheses, III-47

Pulmonary atresia: surgical considerations and results in 103 patients undergoing definitive repair, III-35

**T**

**Technetium**

Perioperative myocardial infarction diagnosed by technetium 99m stannous pyrophosphate myocardial scintigrams, III-24

**Transplantation**

Does cardiac transplantation prolong life and improve its quality? An updated report, III-56

**Tricuspid valve**

Hemodynamic evaluation of Fontan operation in tricuspid atresia, III-99

Operative management of tricuspid regurgitation, III-96

**Truncus arteriosus**

Pulmonary artery banding for truncus arteriosus in the first year of life, III-17

**V**

**Valve replacement**

Actuarial comparison of Hancock porcine and prosthetic disc valves for isolated mitral valve replacement, III-60

Homograft and prosthetic aortic valve replacement: a comparative study, III-84

Mitral valve replacement: a 10-year follow-up of non-cloth-covered vs. cloth-covered caged-ball prostheses, III-47

Myocardial revascularization and mitral repair or replacement for mitral insufficiency due to coronary artery disease, III-94

**Valves**

Relationship between right ventricular muscle bundles and pulmonary valve: significance in pulmonary atresia with intact ventricular septum, III-79

**Vasodilator agents**

Hemodynamic effects of nitroprusside infusion during coronary artery operation in man, III-4

**Veins, saphenous**

Comparison of internal mammary artery and saphenous vein bypass grafts for myocardial revascularization: exercise test and angiographic correlations, III-1

**Ventricular septum**

Relationship between right ventricular muscle bundles and pulmonary valve: significance in pulmonary atresia with intact ventricular septum, III-79